ELECTRICALC® PRO

The ElectriCalc® Pro is an invaluable calculator for today's busy electrical professional. It has intuitively labeled "electrical keys" and conforms to 1996 through 2011 and future National Electrical Codes. The most common NEC tables are now at your fingertips!

The *ElectriCalc*® *Pro* instantly solves for:

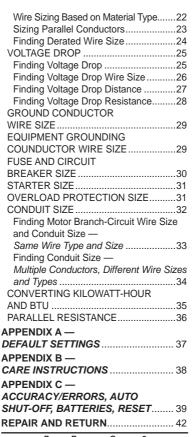
- Volts, Amps, Volt-Amps, Watts, PF%, and EFF%
- Cu and Al Wire Sizes
- Parallel and Derated Wire Sizes
- Voltage Drop Wire Sizes, and Lengths
- Kilowatt hours and BTU's
- Parallel Resistance
- Grounding Conductors
- Motor FLC
- Fuse/Breaker Sizes
- Conduit Sizes
- And much more!



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GETTING STARTED

KEY DEFINITIONS

Basic Function Keys

On/Clear Key — Turns on power, clears the last entry and clears all temporary values

Off — Turns all power off.

Arithmetic operation keys.

(I) - (9) Keys used for entering numbers.

Set Second Function —
Used to access secondary functions.

Store — Stores values.

Storage Registers —

Store values in Memory.

Recall — Used to recall stored values and settings.

Memory Clear — Clears M+ and displays total.

Stor ① M+ — Adds value to Accumulative Memory.



Memory Clear (M-R/C)
— Clears M+ without changing current display.

Percentage — Standard % function.

Set x^2 — Squares the value on the display.

Backspace Function

— Used to delete entries one keystroke at a time.

Set \sqrt{x} — Calculates the Square Root of the displayed value.

Set VD% 1/x — Finds the Reciprocal of a number.

Set X Clear All — Reset all settings, other than

preferences to default.

Set — **+/-** — Toggles sign of value.

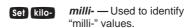
Set + Pi — Displays value of π (3.1415927).

Mode Set-up Keys

- Set Prefs Use to define calculator modes.
- 10 Sets calculator to Single-Phase mode.
- **3Ø** Sets calculator to Three-Phase mode.
- Amb° Enters ambient temperature for finding Wire Sizes.
- Copper/Aluminum
 (Cu/AI) Toggles
 between Copper and
 Aluminum Wire.
- Free Air (FrAir) Sets calculator to Free Air mode.
- 60°C Wire Insulation Sets to 60°C Wire.
- Set 7 75°C Wire Insulation Sets to 75°C Wire.
- Set 90°C Wire Insulation Sets to 90°C Wire.

Electrical Keys

kilo- — Used to identify "kilo-" values.



Amps — Enters or calculates Amps.

Volts — Enters or calculates Volts.

VA Volt-Amps — Enters or calculates Volt-Amps.

Watts — Enters or calculates Watts.

Set Amps DC Amps (Idc) — Enters or calculates DC Amps.

Set Volts DC Volts (Vdc) — Enters or calculates DC Volts.

Set VA DC Resistance (R) —
Enters or calculates DC

Resistance in Ohms.

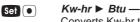
Power Factor (PF%)
— Enters or calculates
Power Factor

HPth Theoretical Horsepower
— Enters or calculates

Theoretical Horsepower.

Set HPth Efficiency (Eff %) —
Enters or calculates the
Power Efficiencies

(cont'd)



Converts Kw-hr to Btu.

BTU to Kilowatt–Hours (Btu ► Kw-hr) —

Converts Btu to Kw-hr.

Set Stor Parallel Resistance (Par Res) — Calculates

total Resistance of Parallel Resistors.

Motor Keys

Set 8 Ind/Sync/DC — Toggles between Motor Types.

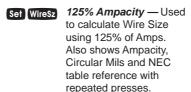
HPmotor Motor Horsepower — Enters or calculates Motor Horsepower.

Set HPmotor Starter Size (Starter) — Displays the Starter Size.

Wire Sizing Keys

Wire Size/Ampacity —
Enters or calculates Wire

Enters or calculates Wird Size. Additional presses show smaller wire size (if Length defined), Ampacity, Circular Mils, and referenced table.



Parsz Parallel Size — Provides
Wire Sizes using Parallel
Conductors. A second
press displays the
Ampacity.

Derated Wire Size (D/R Size) — Calculates
Derated Wire Sizes given a number of wires in the raceway. Also shows
Adjusted Ampacity,
Deration Factor and NEC table reference.

Voltage Drop Keys

Length

Percent Voltage Drop
— Toggles between
Actual Voltage Drop and
Percent Voltage Drop
with repeated presses.

Length — Enters or calculates the Length used for Voltage Drop.

(cont'd)







Wire Resistance (Wire Res) — Displays the Wire Resistance per 1.000 Feet.

Grounding Conductor Keys



Ground - Displays the Copper and Aluminum grounding electrode sizes given an entered Wire Size. Also shows Wire Circular Mils and NEC reference with additional key presses.





Equipment Ground (EqGrnd) — Provides the Copper Equipment Ground size given an entered Wire Size. Additional key presses show Aluminum Ground Size and the NFC reference.

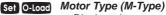
Fuse/Breaker Keys



Overload Protection

- Enters a percent Overload Factor and shows the Overload required based on stored Amps. The percent multiplier is shown on the second key press.





 Displays the current Motor Type for use with Breaker/Fuse sizing.
 Additional presses toggle between Motor Types.

DEFuse Dual Element Fuse

Set DEFuse Single Element Fuse (SEFuse)

Inverse Time Breaker

Set InvTime Instantaneous Trip

Instantaneous Trip
Circuit Breaker (InsTrip)

 Displays the minimum Amp rating and percent multipier.

Conduit Sizing Keys



InvTime

Number of Wires -

Used to enter or calculate the Number of Wires in a raceway and calculate Wire Area. Also shows total Number of Wires and the total area of all wires entered.

(cont'd)



CondSz

Conduit Size — Enters or calculates Conduit Size. Additional presses show the total number of Wires, Percent Fill, Total Wire Area and remaining Wire Area when Conduit Size is calculated

Set CondSz

Conduit Type (Cond Type) — Defines Conduit Type by entering the number correlating to the Types shown below. Repeated presses of Gol CondS2 also toggles through the Conduit Types.

1) EMT	7) LFMC
2) ENT	8) RMC
3) FMC	9) P-80
4) IMC	10) P-40
5) LFNB	11) P-A
6) LFNA	12) P-EB

PREFERENCE SETTINGS

Press set, then to access the Preferences. Continue pressing to toggle through different settings. Press to red keys to toggle between options. Press any other key to exit Preferences.

KEYSTROKE	DISPLAY	
Set + (Prefs)		
(NEC Code)	NEC 2011	
0	NEC 1996	
0	NEC 1999	
0	NEC 2002	
0	NEC 2005	
0	NEC 2008	
(repeats options)	NEC 2011	
Second press of 😝:		
(Ambient		
Temperature Units)	AMBº 30.°C	
0	AMB ^o 86. °C	
(repeats options)	AMBº 30. °C	
Third press of :		
(Length Units)	FEET 1.	
0	MET 1.	
(repeats options)	FEET 1.	



BASIC MATH OPERATIONS

This calculator uses standard chaining logic, calculating values in order entered.

KEYSTROKE	DISPLAY
3020	5.
3-2-	1.
3 X 2 =	6.
3 2 2 =	1.5

PERCENT CALCULATIONS

The % key can be used for finding a given percentage of a number or for working add-on, discount or division percentage calculations.

KEYSTROKE	DISPLAY
355X15%	53.25
250	
6 • 5 %	266.25
25-5%	23.75
1000500%	200.

MEMORY OPERATIONS

The Cumulative Memory is located above ①. Single value storage positions can also be found within digits ① through ②.



Using M+

EYSTROKE	DISPLAY

- 1. Add to Memory:
- 3 5 5 Stor (0 (M+) M+ 355. ₪
- 2 5 5 Set M+ -255. M
- 2. Recall Total:
- RcI (0) TTL 100. M
- Rcl (0) AVG 50. M
- Rci (0) CNT 2. M
- 3. Display/Clear Memory:
- Rci Rci 100.

Using Memory Storage Keys (M1- M9)

- KEYSTROKE DISPLAY
 - (1) 7 (5) Stor (1) M-1 175. Off On/C 0.
 - Off On/C 0.

 Rcl (1) M-1 175.

USING THE ELECTRICALC PRO

KIRCHHOFF'S LAW

The *ElectriCalc Pro* can easily find Volts, Amps, VA, Watts, HP (theoretical), Efficiency and Power Factor.



Finding Voltage

Find the Voltage supply to a 100 load drawing 14,605 VA and 115 Amps.

KEYSTROKE	DISPLAY
On/C On/C	0.
1. Set to 1-Phase: Set (1) (1Ø)	1 Ø 1 PH
2. Enter VA: 14605 VA	VA 14,605.
3. Enter Amps: (1) (1) (5) Amps	AMPS 115.

Finding Amps

Volts

4. Solve for Volts:

What is the current for a load drawing 8.250 VA on a 240V. 3Ø circuit?

VOLT 127.

8,250 VA on a 240V, 32	circuit?
KEYSTROKE	DISPLAY
On/C On/C	0.
1. Set to 3-Phase: Set (3) (3Ø)	3ø 3 PH
2. Enter VA: 8 2 5 0 VA	VA 8,250.
3. Enter Volts: 2 4 0 Volts	VOLT 240.

4. Solve for Amps:

Amps AMPS 19.846416

Finding Volt-Amps

What is the VA rating for a 120 Volt, 22 Amp. 1Ø circuit?

KEYSTROKE DISPLAY
On/O On/O

0.

1. Set to 1-Phase: Set (1) (1Ø)

1 Ø 1 PH

2. Enter Volts:

1 2 0 Volts VOLT 120.

3. Enter Amps: (2)(2) Amps

AMPS 22.

4. Solve for Volt-Amps:

VA VA 2,640.

Finding kW Rating

What's the kW rating for a 90 Amp, 208V, 3Ø boiler with 100% Power Factor?

KEYSTROKE DISPLAY
On/C On/C 0.

1. Set to 3-Phase: Set (3) (3Ø)

зø 3 РН

2. Set Power Factor:

100 Set Watts (PF%) PF% 100.

3. Enter Amps: (9) (0) Amps

AMPS 90.

(cont'd)



KEYSTROKE

DISPLAY

4. Enter Volts:

208 Volts

VOLT 208.

5. Solve for kW:

KW 32.423991

OHM'S LAW

The *ElectriCalc Pro* uses Ohm's Law solve for DC Voltage, Current, or Resistance.

Finding Volts

The Current in a circuit is 0.0125 Amps, and the total Resistance is 480 Ohms. Find the Voltage.

KEYSTROKE

DISPLAY

On/C On/C

0.

1. Enter Current:

• 0 1 2 5 Set Amps (Idc)

Idc 0.0125 A

2. Enter Resistance:

480

Set VA (R)

OHMS 480.

3. Find Voltage:

Set Volts (Vdc)

Vdc 6. v

Finding Amps

A 120k electrical resistor is plugged into a 12 volt circuit. Find the Current.

KEYSTROKE	DISPLAY
On/C On/C	0.
1. Enter Resistance: (1) (2) (0) kilo- Set VA (R)	KOHM 120.

2. Enter Voltage:

12

Set Volts (Vdc)

Vdc 12. v

3. Find Current:

Set Amps (Idc) Idc 0.0001 A

Finding Resistance (Ohms)

An electrical circuit operating at 240 Volts has a Current of 14.6 Amperes. Find the total Resistance.

KEYSTROKE DISPLAY
On/C On/C 0.

1. Enter Voltage:

240

Set Volts (Vdc)

Vdc 240. v

2. Enter Current:

14.6

Set Amps (Idc) Idc 14.6 A

3. Find Resistance:

Sef VA (R) OHMS 16.438356

MOTOR FUNCTIONS

The ElectriCalc Pro can calculate the Full-Load Current (Amps) of a motor, based on Phase, Voltage and Motor (Synchronous, Induction, or DC) Horsepower using NEC Tables 430.247, 430.248 and 430.250.

Finding Full-Load Current

A 2 HP Induction motor operates on 230 Volt, Single-Phase power. What is the Full-Load Current for this motor?

KEYSTROKE

DISPLAY

On/C On/C

0.

Set to 1-Phase:

Set 1 (1Ø)

1 Ø 1 PH

2. Enter Volts:

(2)(3)(0) Volts

VOLT 230.

Enter HP:

2 HPmotor

IND* 2. HP

- * Press Set 8 until IND is displayed in the upper left area of the display.
- 4. Find Full-Load Current:

Amps

FLC 12. A

Finding Motor Wire Size

Find the Wire Size required to connect a continuous run, 3Ø, 10 HP Induction motor into a 230V circuit.

KEYSTROKE

DISPLAY

3Ø 3 PH

On/C On/C

1. Set to 3-Phase:

0.

Set (3) (3Ø)

Set to 60° C: Set (6) (60°)

3Ø 60 3 PH

Set to Copper (if necessary):

Set 4 (Cu/AI) 3Ø 60 Cu 3 PH

Enter Volts:

(2)(3)(0) Volts VOLT 230.

5. Fnter HP: (1)(0)(HPmotor)

IND* 10. HP

* Press Set (8) until IND is displayed in the upper left area of the display.

Find Full-Load Current: Amps

FLC 28. A

7. Find 125% Ampacity Wire Size:

Set WireSz (125%)

AWG 8 CU WIRE SIZE 125%

AMPACITY WIRE SIZING

Wire Sizing is based on Ampacity requirements used in NEC Tables 310.15(B)(16) and 310.15(B)(17).

Wire Sizing

Wiring is being installed for a 240V, 1Ø system rated at 30 kVA. What is the 60° C Copper Wire Size?

(cont'd)







KEYSTROKE	DISPLAY
On/C On/C	0.
1. Set to 1-Phase: Set (10)	1 Ø 1 PH
2. Set to 60° C: Set 6 (60°)	1Ø60 1PH
3. Set to Copper (if ne Set 4 (Cu/Al)	cessary): 1 Ø 60 Cu 1 PH
4. Enter kVA: 3 0 kilo- VA	KVA 30.
5. Enter Volts: 2 4 0 Volts	VOLT 240.

7. Find Wire Size:

6. Find Amps:
Amps

WireSz

AWG 0 CU WIRE SIZE

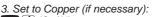
AMPS 125.

Wire Sizing Based on Material Type

Find the Wire Size for a 75°C Copper Wire carrying a 3Ø load of 265 Amps. What is the equivalent Aluminum Wire Size?

KEYSTROKE	DISPLAY
On/C On/C	0.
1. Set to 3-Phase:	
Set (3) (3Ø)	зø 3 РН

2. Set to 75° C: Set 7 (75°) 3ø 75 3 PH



Set 4 (Cu/AI) 3Ø 75 Cu 3 PH

4. Enter Amps:

2 6 5 Amps AMPS 265.

5. Find Wire Size:

WireSz AWG 300 CU WIRE SIZE

Change to Aluminum:

Set 4 (Cu/AI) AWG 400 AL WIRE SIZE

Sizing Parallel Conductors (Free Air)

What size 60°C insulated Copper Wire is required for a single conductor carrying a 500 Amp load in a Free Air environment (30°C Ambient Temperature.)? What size for two Parallel conductors?

KEYSTROKE

DISPLAY

On/C On/C

0.

Set to 60° C:

Set (6) (60°)

60 0.

Set to Copper (if necessary):

Set 4 (Cu/AI)

60 Cu 0.

Set to Free Air mode:

Set (5) (FrAir)

60 Cu FrAir 0.

4. Enter Amps:

5 0 0 Amps

AMPS 500.

5. Find Wire Size for one conductor: WireSz AWG 500 CU WIRE SIZE

(cont'd)



KEYSTROKE

DISPLAY

- 6. Find Wire Size for two conductors:
- ParSz PAR 000 CU WIRE SIZE
- 7. Exit Free Air Mode and Clear: Set (5) On/C 60 Cu 0.

Finding Derated Wire Size

A circuit was built with 60°C Copper wire connecting a 47,650 VA load to a 240 Volt, 3Ø source. Ambient Temperature is 50°C. What is the Derated Wire Size required if eight current-carrying THHN wires are installed in the raceway?

KEYSTROKE
On/C On/C

DISPLAY 0.

1. Set to 3-Phase:

зø 3 РН

Set (3) (3Ø) 2. Set to 60° C:

Set 6 (60°) 3Ø 60 3 PH

3. Set to Copper (if necessary):

Set 4 (Cu/AI) 3ø 60 Cu 3 PH

4. Enter Volt-Amps:

47650 VA VA 47,650.

5. Enter Volts:

(2)(4)(0) Volts VOLT 240.

6. Find Amps:
Amps

AMPS 114.62808.

7. Set to 50° C Ambient Temperature:

50 Set 2

(Amb^o) Ami

Amb AMB° 50. °C

8. Find Derated Wire Size:

Set ParSz

(D/R Size) D/R 500 CU WIRE SIZE

Reset Ambient Temperature and Clear:

3 0 Set 2 On/C

3Ø 60 Cu **0.**

VOLTAGE DROP

The *ElectriCalc Pro* uses Resistance values found in NEC Table 8 Chapter 9 to determine Voltage Drop, Wire Lengths or Wire Sizes given a maximum Voltage Drop percentage.

Finding Voltage Drop

You are installing 175 Feet of 75°C, #8 THW branch circuit Copper conductors to supply an 11A load on a 208V 1Ø system. What is the source Voltage Drop at the load?

KE)	/S1	ΓR	റ	KE

DISPLAY

On/C On/C

0.

1. Set to 1-Phase:

Set 1 (1Ø)

1 Ø 1 PH

2. Set to 75 ° C: Set (7) (75°)

1 Ø 75 1 PH

(cont'd)



KEYSTROKE

DISPLAY

3. Set to Copper (if necessary):

Set 4 (Cu/AI) 1 Ø 75 Cu 1 PH

4. Enter Amps:

1 Amps

AMPS 11.

5. Enter Volts:

(2)(0)(8) Volts VOLT 208.

6. Enter Lenath:

7 5 Length FEET 175.

7. Enter Wire Size:

8 WireSz AWG 8 CU WIRE SIZE

8. Solve Voltage Drop:

VD% DROP 3.0 v

9. Solve percent Voltage Drop:

VD% DROP 1.4 % V

Finding Voltage Drop Wire Size

A 20 Amp, 3Ø 208 Volt load will be located 175 Feet away from the source. Assuming a 3% allowable Voltage Drop, what is the size of 75°C conductor required for this branch circuit?

KEYSTROKE

DISPLAY

On/C On/C 0.

1. Set to 3-Phase:

Set (3) (3Ø) 3Ø PH

Set to 75° C:

Set (7) (75° C) 3Ø 75 3 PH

- 3. Set to Copper (if necessary):
- Set 4 (Cu/AI) 3Ø 75 Cu 3 PH
- 4. Enter Amps:
- (2) (0) Amps AMPS 20.
- 5. Enter Volts:
- 2 0 8 Volts VOLT 208.
- 6. Enter Length:
- 175 Length FEET 175.
- 7. Enter allowable VD%:
- 3 VD% DROP 3.0 % V
- 8. Find Wire Size:

WireSz AWG 8 CU VD WIRE SIZE

Finding Voltage Drop Distance

How far from a Three-Phase 240 Volt source can you install a 15 Amp load using 60°C #10 Copper branch circuit conductors? Assume a 3% allowable Voltage Drop.

KEYSTROKE DISPLAY

On/C On/C

- 1. Set to 3-Phase:
 Set (3) (3Ø) 3Ø 3 PH
- 2 Set to 60° C:
- Set 6 (60°) 3ø 60 3 PH
- 3. Set to Copper (if necessary):
 Set 4 (Cu/Al) 3ø 60 cu 3 PH

(cont'd)

0.



KEYSTROKE

DISPLAY

- 4. Enter Amps:
- 1 5 Amps

AMPS 15.

- 5. Enter Volts:
- (2)(4)(0) Volts

VOLT 240.

- 6. Enter Wire Size:
- 1 0 WireSz * AWG 10 CU WIRE SIZE
- 7. Enter 3% allowable Voltage Drop: **DROP 3.0 % v**
- 3 VD%

8. Find distance:

Length

FEET 234.86987

Finding Voltage Drop Resistance

What is the Resistance per 1,000 Ft. of #2 90° C Copper conductor?

KEYSTROKE

DISPLAY

0.

On/C On/C

 Set to 90° C: Set (9) (90°)

90 0.

- 2. Set to Copper (if necessary):
- Set 4 (Cu/AI)

90 Cu 0.

- 3. Enter Wire Size:
- WireSz *

AWG 2 CU WIRE SIZE

4. Find Resistance:

Set Length

(Wire Res) OHMS 0.2033993 WIRE

GROUND CONDUCTOR WIRE SIZE

The *ElectriCalc Pro* uses NEC Table 250.66 to find the Grounding Electric Conductor Size for an entered Feeder Size.

Find the Grounding electrode conductor Wire Size required when a 2/0 Copper service-entrance conductor is being used.

KEYSTROKE

DISPLAY

On/C On/C

0.

1. Enter Wire Size and find Ground Wire Size:

GRND 4 CU WIRE SIZE

2. Find Aluminum size:
Grnd GRND

GRND 2 AL WIRE SIZE

EQUIPMENT GROUNDING COUNDUCTOR WIRE SIZE

The ElectriCalc Pro uses an external amperage to find the Equipment Grounding conductor based on NEC Table 250.122.

Find the Equipment Grounding conductor size required when the circuit breaker is rated at 45 Amps.

(cont'd)



KEYSTROKE

DISPLAY

On/C On/C

0.

Find Equipment Ground Wire Size:

4 5 Set

Grnd (EgGrnd) EQPG 10 CU WIRE SIZE

2. Find Aluminum size:

Grnd EQPG

EQPG 8 AL WIRE SIZE

FUSE AND CIRCUIT BREAKER SIZE

Fuse and Breaker sizing is determined by NEC Table 430.52. Once the Motor Type is defined via Set O-Loco, a Full-Load Current amperage value can be used to find the Fuse Breaker Sizes.

What is the Dual Element Fuse size for a 230 Volt, 3-Phase, 50 HP Induction motor?

KEYSTROKE

DISPLAY

On/C On/C

0.

1. Set to 3-Phase:

Set (3) (3Ø)

зø 3 РН

2. Enter Volts:

(2)(3)(0) Volts

VOLT 230.

3. Enter HP:

(5) (0) HPmotor

IND* 50. HP

* Press Set 8 until IND is displayed in the upper left area of the display.



4. Find Full-Load Current:

Amps

FLC 130. A

5. Find Dual Element Fuse size:

DEFuse

AMPS 227.5 dE

STARTER SIZE

What size NEMA Starter is required for a 575 Volt, 3Ø, 20 HP Induction motor?

KEYSTROKE

DISPLAY

On/C On/C

0.

1. Set to 3-phase: Set (3) (3Ø)

3Ø 3 PH

Enter Volts:

5 7 5 Volts

VOLT 575.

3. Enter HP:

(2)(0) HPmotor

IND* 20. HP

* Press Set (8) until IND is displayed in the upper left area of the display.

4. Solve for Starter Size:

Set HPmotor (Starter)

STAR SIZE 2

OVERLOAD PROTECTION SIZE

What Overload Protection device size is required for an Induction motor with a nameplate rating of 19.2 Amps and a 1.0 service factor? What is the required Overload at 125% (for a 1.15 service factor)?

(cont'd)



NEYSTROKE On/C On/C 1. Enter nameplate Current: (1) (2) (2) Amps AMPS 19.2 2. Find Overload size: (1) (1) (5) (0-Load) AMPS 22.08 o I 3. Display percent used: (0-Load) %FLC 115. %

4. Find 125% Load:

1 2 5 O-Load AMPS 24. o I

5. Display percent used:

O-Load %FLC 125. %

6. Reset Overload rating and Clear:

(1) (1) (5) 0-Load On/C 0.

CONDUIT SIZE

The ElectriCalc Pro can calculate the size of Conduit required when running single or multiple Wires using the conds? key and the calculator's internal tables. To select a specific Conduit Type, enter the corresponding number of the Conduit as shown below and then press sel conds?

- 1) EMT 4) IMC 7) LFMC 10) P-40
- 2) ENT 5) LFNB 8) RMC 11) P-A
- 3) FMC 6) LFNA 9) P-80 12) P-EB

Finding Motor Branch-Circuit Wire Size and Conduit Size — Same Wire Type and Size

What size THHN Copper Wire and RMC Conduit are needed to connect a 10 HP 1Ø Induction motor to a 115 Volt source?

KEYSTROKE

DISPLAY

On/C On/C

0.

Set to 1-Phase:

Set (1) (1Ø)

1 Ø 1 PH

Set to 60° C:

Set (6) (60°)

1 Ø 60 1 PH

Set to Copper (if necessary): Set 4 (Cu/AI)

1 Ø 60 Cu 1 PH

Enter Volts:

(1)(1)(5) Volts

VOLT 115.

5. Enter Horsepower:

1 (1) (HPmotor

IND 10. HP

* Press Set (8) until IND is displayed in the upper left area of the display.

6. Display Full-Load Amps:

Amps

FLC 100. A

7. Find Wire Size at 125% Ampacity:

Set WireSz (125%)

AWG 0 CU WIRF SIZE 125%

8. Find Wire Ampacity:

WireSz

Ø 125.0 WIRE A125%

(cont'd)



KEYSTROKE

DISPLAY

- Enter Conduit Type and find Conduit Size:
- 8 Set CondSz

(Cond Type) RMC 1.25 in COND SIZE

10. Find total number of Wires:

CondSz

TTL WIRES

11. Find Conduit Fill Percent:

CondSz

FILL 24.3 % COND

12. Find actual Fill Area:

Cond\$z FILL 0.3710 1

FILL 0.3710 TTL WIRE AREA

13. Find Remaining Area:

CondSz

REM 0.1021 WIRE AREA

Finding Conduit Size — Multiple Conductors, Different Wire Sizes and Types

Three 1/0 THWN conductors and one #2 XHHW conductor are to connect to a panel board using a single Conduit. What is Conduit Size needed and actual Fill Area?

KEYSTROKE

DISPLAY

On/C On/C

0.

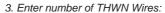
- 1. Enter Conduit Type:
- (Cond Type)

FMC nonE COND

2. Enter first Wire Size:

Wire\$z

AWG 0 CU WIRE SIZE



THHN 3. WIRES

4. Enter second Wire Size:

2 WireSz * AWG 2 CU WIRE SIZE

5. Enter number of XHHW Wires:

1) #XHHW XHHW 1. WIRE

6. Find Conduit Size:

CondSz FMC 1.50 in COND SIZE

7. Find total number of Wires:

CondSz 4. TTL WIRES

8. Find Conduit Fill Percent:

CondSz FILL 36.1 % COND

9. Find actual Fill Area:

CondSz FILL 0.6711 TTL WIRE AREA

10. Find Remaining Area:

CondSz REM 0.0717 WIRE AREA

CONVERTING KILOWATT-HOUR AND BTU

Find the equivalent BTU rating of a 3.5 kilowatt-hour rated furnace.

KEYSTROKE DISPLAY

On/C On/C

1. Enter kilowatt hours:

3 • 5

2. Find equivalent BTU:

Set (Kw-hr ► Btu) BTU 11,953.552

(cont'd)

0.



What is the kilowatt-hour rating for a 4,500 BTU heater?

KEYSTROKE

DISPLAY

On/C On/C

0.

1. Enter BTU rating:

4500

4,500.

2. Find equivalent kilowatt hours: Set ☐ (Btu ► Kw-hr) KW-H 1.3176

PARALLEL RESISTANCE

Find the equivalent Resistance for 10 Ohm, 20 Ohm, and 50 Ohm resistors placed in parallel.

KEYSTROKE

DISPLAY

On/C On/C

0.

1. Enter first Resistor:

(Par Res)

P-RS 10.

2. Enter second Resistor:

20 Set Stor (Par Res)

P-RS 6.666667

3. Enter third Resistor:

5 0 Set Stor (Par Res)

P-RS 5.8823529

Note: The total is recalculated with each additional Resistor value entered.

APPENDIX A — DEFAULT SETTINGS

After a Clear All (Set X), your calculator will return to the following settings:

STORED VALUES	DEFAULT VALUE
Insulation Rating	60° C
Wire Material	Copper
Phase	3Ø
Ambient	200 C (000 E)
Temperature	30° C (86° F)
Volts	240V
Voltage Drop %	3%
Power Factor %	100%
Efficiency %	100%
Motor Type	Induction
Conduit Type	EMT
Fuse/Breaker	Squirrel Cage
Motor Type	non Design E
Overload FLC%	115%
Free Air Mode*	Off
* This setting will also return to its default	

^{*} This setting will also return to its default upon turning the calculator off and back on.

If you replace your batteries or perform a Full Reset* (Press off, hold down X and press on/C) your calculator will return to the following settings (in addition to those listed above):

(cont'd)



PREFERENCE	DEFAULT
SETTINGS	VALUE
NEC Code	2011

Temperature Units °C

Length Units FEET

* Depressing the Reset button located above the CondS2 key will also perform a Full Reset.

APPENDIX B — CARE INSTRUCTIONS

Please follow the guidelines listed in this section for proper care and operation of your calculator. Not following the instructions listed below may result in damage not covered by your warranty. Refer to the *Warranty* section on page 61 of the *User's Guide* for more details...

Do not expose calculator to temperatures outside the operating temperature range of 32°F – 104°F (0°C – 40°C).

Do not expose calculator to high moisture such as submersion in water, heavy rain, etc.

APPENDIX C — ACCURACY/ERRORS, AUTO SHUT-OFF, BATTERIES, RESET

Accuracy/Errors

Accuracy/Display Capacity — Your calculator has an eight-digit display. You may enter or calculate values up to 99,999,999. Each calculation is carried out internally to 12 digits.

Errors — When an incorrect entry is made, or the answer is beyond the range of the calculator, an error message will display. To clear an error condition, press the On/C button once. At this point, you can determine what caused the error and re-key the problem.

Error Codes

DISPLAY	ERROR TYPE
OFLO	Overflow; an- swer too large to display
ENT Error	Invalid entry
POWR Error	Power Factor (PF) or Ef- ficiency (EFF) calculated above 100%





nonE Unable to

calculate or not

available

HP Error Invalid Horse-

power entry per

NEC table

FULL Error Entered or

calculated more than 15 different

Wires Sizes

EROM Error Bad EPROM

MATH Error Math error (i.e.,

divide by zero)

AUTO SHUT-OFF

Your calculator is designed to shut itself off after about 8-12 minutes of non-use.

BATTERY

The *ElectriCalc Pro* uses one CR2016 battery. Should your calculator display become dim or erratic, replace the battery.

NOTE: Please use caution when disposing of your old battery as it contains hazardous chemicals.

Replacement batteries are available at most discount or electronics stores. You may also call Calculated Industries at 1-775-885-4900 or go to www.calculated.com.

Battery Replacement Instructions

While the calculator is off, turn the calculator over and use a #1 Phillips screwdriver to remove the battery holder screw located near the center at the top. With the screw removed, pull battery holder out, remove old battery, and slide new battery into holder.

The negative side of the battery should be facing you as you insert the battery holder into the calculator. Replace screw using a #1 Phillips screwdriver.



RESET

If your calculator should ever "lock up," press Reset — a small hole located below the off key — to perform a total reset.



REPAIR AND RETURN

RETURN GUIDELINES

- Please read the Warranty in the User's Guide to determine if your Calculated Industries product remains under warranty before calling or returning any device for evaluation or repairs.
- If your product won't turn on, check the battery as outlined in the User's Guide.
- If you need more assistance, please go to the website listed below.
- If you believe you need to return your product, please call a Calculated Industries representative between the hours of 7:00am to 4:30pm Pacific Time for additional information and a Return Merchandise Authorization (RMA).

Call Toll Free: 1-800-854-8075 Outside USA: 775-885-4900 www.calculated.com/warranty



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